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A BRIEF REVIEW ON 4-THIAZOLIDINONE DERIVATIVES FOR VARIOUS ANTI CANCER ACTIVITY

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ABSTRACT

Thiazolidinone, a saturated form of thiazole with carbonyl group on fourth carbon, has been considered as a magic moiety (wonder nucleus) which posses almost all types of biological activities. This diversity in the biological response profile has attracted the attention of many researchers to explore this skeleton to its multiple potential against several activities. Present article is sincere attempt to review chemistry, synthesis, spectral studies and applications of 4-thiazolidinone.

KEYWORDS: Antifungal, antimicrobial, anti-cancer, anti-HIV agent, anti-inflammatory.

INTRODUCTION

Thiazolidinones are the derivatives of thiazolidine which belong to an important group of heterocyclic compounds containing sulfur and nitrogen in a five member ring. A lot of research work on thiazolidinones has been done in the past. The nucleus is also known as wonder nucleus because it gives out different derivatives with all different types of biological activities. Numbers of methods for synthesis by using various agents are available in the references.

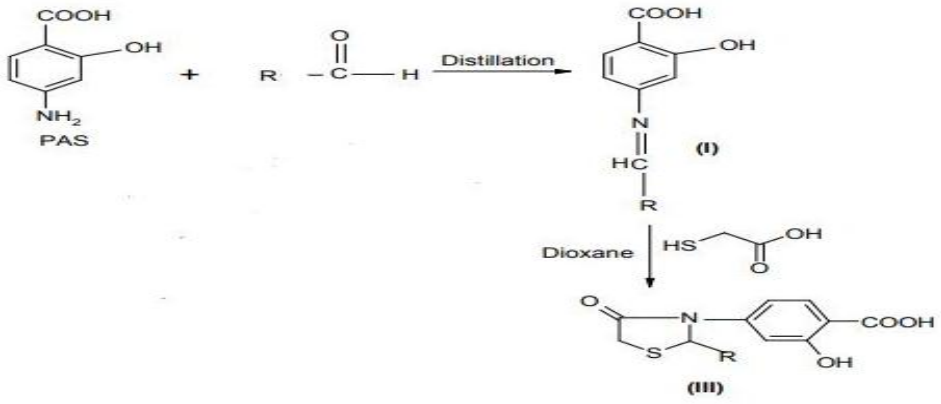
Physical Properties

The 3-unsubstituted 4-thiazolidinones are usually solids, often melting with decomposition, but the attachment of an alkyl group to the nitrogen lowers the melting point. The 4-thiazolidinones that do not contain aryl or higher alkyl substituents are somewhat soluble in water 1. Chemistry Considerable confusion concerning the structure of 4-thiazolidinones exist in the early literature and noncyclic formulas were at first proposed for pseudothiohydantoin and for rhodanine 1. 4-thiazolidinones are derivatives of thiazolidine with a carbonyl group at the 4 position 2. Substitution is possible at 2, 3 and 5 position. Various optical and geometrical isomers are reported in the references 3. A series of regioselective isomers has been reported in some works.[4,5] The carbonyl group of 4- thiazolidinone is highly unreactive. But in few cases 4-thiazolidinone on reaction with Lawesson's reagent gives corresponding 4-thione derivative.

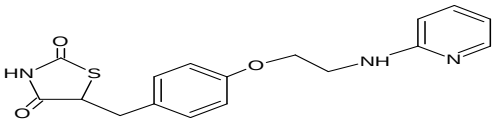
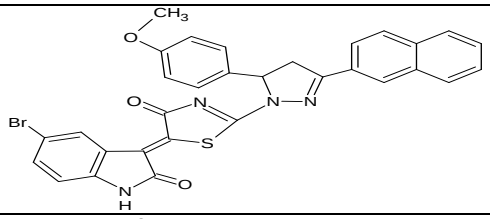
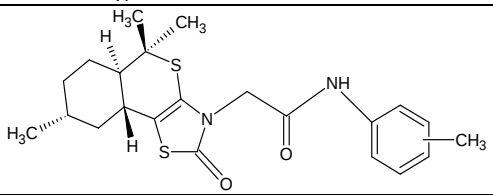
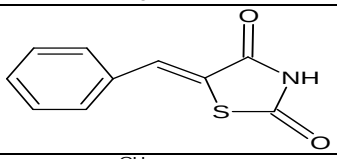
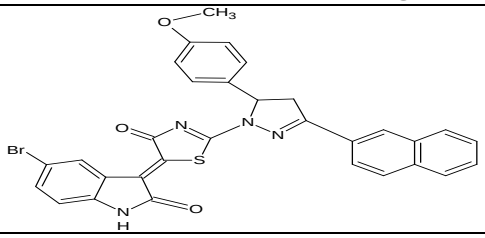
Syntheses of 4-Thiazolidinones

Thiazolidinones and their derivatives display a large variety of activities such as antibiotic, diuretic, organoleptic, tuberculostatic, antileukaemic and antiparasitical. As far as literature is concerned, little is known about thiazolidinones and their bioactivities. Thiazolidinones (1) are classified as doubly unsaturated five membered heterocyclic compounds contain one nitrogen, one sulphur and three carbon atoms including a carbonyl group.

To a solution of compound Ic (1mmol) in dry dioxane (10 ml) a solution of mercaptoacetic acid (10 mmol) in dry dioxane (10 ml) was added followed by catalytic amount of zinc chloride (15 mg), and reaction mixture was refluxed for 8h, mixture was evaporated electrical water bath. Residue was then treated by solution of bicarbonate to remove excess of mercaptoacetic acid.



4-Thiazolidinone derivatives having various anti cancer activity.

Structures	Cell- Lines	Location
	SCC-15	Epithelial Cells
	MCF-7	Breast
	HOP-92	Lung
	PC-3	Prostate
	WM793	Ovarian Cell

CONCLUSION

The reviewed 4-Thiazolidinone is aunique template that is associated with several biological activities. The various 4-thiazolidinone derivatives have activities like anti neoplasmic, antimicrobial, anti fungal, anti-inflammatory, anti convulsant, analgesic, diuretic, anti-prostrate cancer activities etc.

4-thiazolidinone has diverse biological potential, and the easy synthetic routes for synthesis have taken attention of the chemists, pharmacologists and researchers. The anticancer and anti HIV activities are the most encouraging activities for the pharmacists. Also the research in anticonvulsant, FSH agonistic and CFTR inhibitory activity has given positive results. By the present scenario it can be concluded that the compound have significant role to curing various diseases.

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